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| APPLICATION NO. | FILING DATE | FIRST NAMED INVENTOR | ATTORNEY DOCKET NO. | CONFIRMATION NO. |
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| 09/656,692 | 09/07/2000 | Kenichi Hamada | 0941.64727 | 2392 |
| 24978 | 7590 | 12/03/2004 | EXAMINER | |
| GREER, BURNS & CRAIN 300 S WACKER DR 25TH FLOOR CHICAGO, IL 60606 | | | PSITOS, ARISTOTELIS M | |
| | | | ART UNIT | PAPER NUMBER |
| | | | 2653 | |

DATE MAILED: 12/03/2004

Please find below and/or attached an Office communication concerning this application or proceeding.

| <i>Office Action Summary</i> | Application No. | Applicant(s) |
|------------------------------|-----------------|---------------|
| | 09/656,692 | HAMADA ET AL. |
| Examiner | Art Unit | |
| Aristotelis M Psitos | 2653 | |

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133).
- Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1) Responsive to communication(s) filed on 29 October 2004.

2a) This action is **FINAL**. 2b) This action is non-final.

3) Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4) Claim(s) 1-20 is/are pending in the application.
4a) Of the above claim(s) _____ is/are withdrawn from consideration.
5) Claim(s) _____ is/are allowed.
6) Claim(s) 1-20 is/are rejected.
7) Claim(s) _____ is/are objected to.
8) Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9) The specification is objected to by the Examiner.

10) The drawing(s) filed on _____ is/are: a) accepted or b) objected to by the Examiner.

 Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

 Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11) The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

12) Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
a) All b) Some * c) None of:
1. Certified copies of the priority documents have been received.
2. Certified copies of the priority documents have been received in Application No. _____.
3. Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

1) Notice of References Cited (PTO-892)
2) Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08)
Paper No(s)/Mail Date _____.
4) Interview Summary (PTO-413)
Paper No(s)/Mail Date _____.
5) Notice of Informal Patent Application (PTO-152)
6) Other: _____.

Art Unit: 2653

DETAILED ACTION

Applicants' response of 10/29/04 has been considered with the following results.

The finality of the previous OA is hereby withdrawn. The amendment of 10/29/04 has been entered and the following position is taken.

Specification

The amendment filed 10/29/04 is objected to under 35 U.S.C. 132 because it introduces new matter into the disclosure. 35 U.S.C. 132 states that no amendment shall introduce new matter into the disclosure of the invention. The added material which is not supported by the original disclosure is as follows: The amendments as presented in the above noted communication on pages 15, lines 13 plus, lines 30 plus, page 16 line 27 to page 17 line 9 page 17 lines 21 plus, page 17 lines 32 plus.

The examiner disagrees with applicants' position that such amendments are not new matter, since as originally disclosed support as present existed to the now canceled subject matter and no support existed for the newly introduced language.

Drawings

The substituted figure 4 is also objected to since it incorporates the above noted corrections. The examiner cannot reconcile this figure with that found in the priority document.

Applicant is required to cancel the new matter in the reply to this Office Action.

Claim Rejections - 35 USC § 112

The following is a quotation of the first paragraph of 35 U.S.C. 112:

The specification shall contain a written description of the invention, and of the manner and process of making and using it, in such full, clear, concise, and exact terms as to enable any person skilled in the art to which it pertains, or with which it is most nearly connected, to make and use the same and shall set forth the best mode contemplated by the inventor of carrying out his invention.

Claims 1-20 are rejected under 35 U.S.C. 112, first paragraph, as failing to comply with the written description requirement. The claim(s) contains subject matter, which was not described in the specification in such a way as to reasonably convey to one skilled in the relevant art that the inventor(s), at the time the application was filed, had possession of the claimed invention.

Art Unit: 2653

In particular, applicants' have amended the specification with respect to the description of the operation of element 233. Nevertheless, such amendments find no support in the specification as originally filed. Furthermore, such amendments to the figures do not agree with applicants' priority document, hence the examiner concludes that if such amendments were to be entered, the priority date previously granted would no longer be proper. Further response is respectfully required. Since independent claims 1,18 and 19 all require such a description as both independent claims now recite the phase error calculation circuit as now amended, the claims are now drawn to new matter.

Dependent claims 2-17, and 20 fail to clarify the above and fall accordingly.

The previously allowed subject matter is hereby withdrawn in view of the newly discovered prior art.

Double Patenting

The nonstatutory double patenting rejection is based on a judicially created doctrine grounded in public policy (a policy reflected in the statute) so as to prevent the unjustified or improper timewise extension of the "right to exclude" granted by a patent and to prevent possible harassment by multiple assignees. See *In re Goodman*, 11 F.3d 1046, 29 USPQ2d 2010 (Fed. Cir. 1993); *In re Longi*, 759 F.2d 887, 225 USPQ 645 (Fed. Cir. 1985); *In re Van Ornum*, 686 F.2d 937, 214 USPQ 761 (CCPA 1982); *In re Vogel*, 422 F.2d 438, 164 USPQ 619 (CCPA 1970); and, *In re Thorington*, 418 F.2d 528, 163 USPQ 644 (CCPA 1969).

A timely filed terminal disclaimer in compliance with 37 CFR 1.321(c) may be used to overcome an actual or provisional rejection based on a nonstatutory double patenting ground provided the conflicting application or patent is shown to be commonly owned with this application. See 37 CFR 1.130(b).

Effective January 1, 1994, a registered attorney or agent of record may sign a terminal disclaimer. A terminal disclaimer signed by the assignee must fully comply with 37 CFR 3.73(b).

1. Claims 1,3-6,9-10,11 and 17 are rejected under the judicially created doctrine of obviousness-type double patenting as being unpatentable over claims 1, 2,3,10 of U.S. Patent No. 6151282 in view of Tsuchinaga. With respect to pending claim 1 and patent claim 1, the difference focuses upon the three consecutive samples and the exclusion of the edge detection language. That is claim 1 of the patent already includes the claim limitations of present claim 4 (edge detections), claims 2 and 3 of the patent meet the limitations of claims 5 and 6 of this application, claim10 of the patent meets the limitations of claims 9 and 10 of this application. The consecutive three-sample limitation of the present claim is taught by the Tsuchinaga reference – see the above analysis. With respect to claim 11, the acquisition mode is discussed in col 13, lines 50-57 of Tsuchinaga, and hence such a modification is also taught in order to

Art Unit: 2653

reduce the processing time of the pll. With respect to claim 17, see the description of figure 6 wherein the output of the phase comparator 207 is normalized as previously described by the amplitude compensation operations.

It would have been obvious to modify the base system of Hamada et al with the above additional teaching from Tsuchinaga, motivation is to perform the ternary sampling and hence increase the performance of the pll.

2. Claims 2,7 and 8 is rejected under the judicially created doctrine of obviousness-type double patenting as being unpatentable over claim 1 of U.S. Patent No. 6151282 (Hamada) in view of Tsuchinaga further considered with Kiyanagi et al. The reliance upon claim 1 of the Hamada et al patent and Tsuchinaga is as discussed above. Claim 2 adds the absolute value limitation which is further taught by the Kiyanagi et al reference – see the discussion with respect to figure 8. The recitation of claims 7 and 8 are interpreted by the examiner as referring to the absolute value as it either increase or decrease along the curve noted in figure 6.

It would have been obvious to further modify the above base system of Hamada et al and Tsuchinaga with the additional teaching from Kiyanagi et al; motivation is to ensure proper error correction abilities.

3. Claims 12,14-16 are rejected under the judicially created doctrine of obviousness-type double patenting as being unpatentable over claim 1 of U.S. Patent No. 6151282 in view of Tsuchinaga further considered with Ogura.

With respect to claim 12, as interpreted by the examiner, Ogura discloses the ability of varying the time control (convergence) of the operation of his pll – see the discussion with respect to figures 6-9.

With respect to claim 14, Ogura also teaches the ability of gain switching ability – see the description of figure 20.

With respect to claims 15-16, Ogura also teaches the ability of having equalizer in his reproduction output circuitry for the inherent use thereof.

It would have been obvious to modify the base system of Hamada and Tsuchinaga with the above teachings from Ogura, motivation is as discussed in Ogura a) with respect to claim 12, vary the

Art Unit: 2653

convergence – time control of the appropriate modes/loops, b) with respect to claim 14 so as to also correspondingly vary the gain in accordance with the operational mode, and c) with respect to claims 15-16 use of equalizers for their inherent signal processing.

4. Claim 13 is rejected under the judicially created doctrine of obviousness-type double patenting as being unpatentable over claim 1 of U.S. Patent No. 6151282 in view of Tsuchinaga further considered with Sugawara.

With respect to the additional converging range setting element, although the examiner considers the ability of the threshold generators as providing such, since setting of the thresholds in figure 11 permit the comparison stages to appropriately zero in /converge correctly and hence meet the range setting circuit, this is further elaborated upon by the Sugawara document with the discussion focusing upon the cooperation of his quantized levels (quantization section), the threshold levels, and his switching elements which establish the appropriate “converging range”.

It would have been obvious to modify the base system of Hamada and Tsuchinaga as stated above in paragraph 1 with this additional ability so as to set the converging range, and in doing so yielding a more robust pll system.

Claim Rejections - 35 USC § 102

The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

(e) the invention was described in (1) an application for patent, published under section 122(b), by another filed in the United States before the invention by the applicant for patent or (2) a patent granted on an application for patent by another filed in the United States before the invention by the applicant for patent, except that an international application filed under the treaty defined in section 351(a) shall have the effects for purposes of this subsection of an application filed in the United States only if the international application designated the United States and was published under Article 21(2) of such treaty in the English language.

Claim Rejections - 35 USC § 103

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

The factual inquiries set forth in *Graham v. John Deere Co.*, 383 U.S. 1, 148 USPQ 459 (1966), that are applied for establishing a background for determining obviousness under 35 U.S.C. 103(a) are summarized as follows:

1. Determining the scope and contents of the prior art.
2. Ascertaining the differences between the prior art and the claims at issue.
3. Resolving the level of ordinary skill in the pertinent art.
4. Considering objective evidence present in the application indicating obviousness or nonobviousness.

This application currently names joint inventors. In considering patentability of the claims under 35 U.S.C. 103(a), the examiner presumes that the subject matter of the various claims was commonly owned at the time any inventions covered therein were made absent any evidence to the contrary. Applicant is advised of the obligation under 37 CFR 1.56 to point out the inventor and invention dates of each claim that was not commonly owned at the time a later invention was made in order for the examiner to consider the applicability of 35 U.S.C. 103(c) and potential 35 U.S.C. 102(e), (f) or (g) prior art under 35 U.S.C. 103(a).

5. Claims 1,3,4-8,11,13,17-20 are rejected under 35 U.S.C. 102(e) as being anticipated by Tsuchinaga.

With respect to independent claims 1 and 19, applicants' attention is drawn to Tsuchinaga, focusing upon the description of figures 4, 7, 9 and 10 as well as col. 18, lines 40-46. The samples are as recited 3 consecutive and differences there between as well as the configuration of the phase error calculation circuit of claim 18.

Art Unit: 2653

With respect to claim 3, the phase error is as interpreted by the examiner in this document calculated continuously in the appropriate mode of operation – i.e., an acquisition mode.

With respect to claims 4-8, the description of the term LF and LR with respect to the rising and falling edges of the samples meets – see the description of figure 6 for instance.

With respect to claim 11, col. 13 lines 50 plus discuss the acquisition mode of operation and the examiner interprets such as present and that the phase error is continuously provided for and hence inherently there must be an appropriate switching circuit so as to permit the shifting from one mode initial/acquisition to tracking as required.

With respect to claim 13, the examiner interprets such a range converging setting element as the interaction between the voc output in fig. 17 as it then controls element 2204.

With respect to claim 17, see the description of figure 6 wherein the output of the phase comparator 207 is normalized as previously described by the amplitude compensation operations.

With respect to claim 20, it is an optical environment

6. Claim 2 is rejected under 35 U.S.C. 103(a) as being unpatentable over the art as relied upon with respect to claim 1 and further considered with Fujimoto/Kiyanagi et al.

There is no clear depiction that the error compensation is as recited in this claim based on absolute value differences.

The ability of providing absolute values in this environment is taught by the Fujimoto document with respect to the description of figure 11.

Alternatively, Kiyanagi et al teaches the increase signal performance in pll using/having absolute value detection evaluation.

It would have been obvious to modify the base system of Tsuchinaga et al with the above teaching from either Fujimoto/Kiyanagi motivation is to obtain a more precise signal evaluation in order to reduce errors in the evaluation process.

7. Claims 9-10 are rejected under 35 U.S.C. 103(a) as being unpatentable over the art as applied to claim 1 above, and further in view of Coleman.

Art Unit: 2653

With respect to these claims, the above noted base reference fails to describe the ability with respect to offsetting the read signal appropriately.

Coleman et al discloses in the environment of edge detection, the additional capability of offsetting such as the need arises in order to improve the accuracy – see the abstract for instance.

It would have been obvious to modify the base system of Tsuchinaga with the above teaching from Coleman et al, motivation is as discussed in Coleman et al.

8. Claims 12,14-16 are rejected under 35 U.S.C. 103(a) as being unpatentable over the art as applied to claim 1 above, and further in view of Ogura.

With respect to claim 12, as interpreted by the examiner, Ogura discloses the ability of varying the time control (convergence) of the operation of his pll – see the discussion with respect to figures 6-9.

With respect to claim 14, Ogura also teaches the ability of gain switching ability – see the description of figure 20.

With respect to claims 15-16, Ogura also teaches the ability of having equalizer in his reproduction output circuitry for the inherent use thereof.

It would have been obvious to modify the base system of Tsuchinaga with the above teachings from Ogura, motivation is as discussed in Ogura a) with respect to claim 12, vary the convergence – time control of the appropriate modes/loops, b) with respect to claim 14 so as to also correspondingly vary the gain in accordance with the operational mode, and c) with respect to claims 15-16 use of equalizers for their inherent signal processing.

9. Claims 1,2,4-8 and 19-20 are rejected under 35 U.S.C. 102(b) as being anticipated by Fujimoto.

With respect to claim 1, Fujimoto et al discloses an optical playback system wherein pll is appropriately relied upon for subsequent signal processing of the incoming information. As described with respect to figure 4 for instance the first and second interpolation elements provide for the sampling of 3 points – see the description commencing at col 5 line 59 and continuing to col. 6 line 63.

With respect to the limitations of claim 2, see the discussion with respect to figure 11.

Art Unit: 2653

With respect to claims 4-8 the examiner interprets the discussion with respect to the edge detection as it concerns figure 11 as meeting these claims.

With respect to claims 19-20, see the above discussion with respect to 3 consecutive samples and the system of Fujimoto is drawn to an optical disc.

10. Claim 3 is rejected under 35 U.S.C. 102(b) as anticipated by or, in the alternative, under 35 U.S.C. 103(a) as obvious over Fujimoto considered with Tsuchinaga.

With respect to claim 3, the examiner interprets the operation of the base reference as an initial mode of operation. Although the reference itself doesn't quite state such terms, the examiner concludes that this is an initial state of operation. Additionally, such initial states are referred to as acquisition states, modes – see the discussion in Tsuchinaga – at col. 13 lines 50-58.

Hence under 102 considerations the examiner concludes such is inherently present in Fujimoto, or alternatively if applicants' can convince the examiner that there is no initial state of operation, then under 103 grounds relying upon the additional teaching from Tsuchinaga with respect to initial/acquisition modes of operation.

11. Claims 9-10 are rejected under 35 U.S.C. 103(a) as being unpatentable over the art as applied to claim 1 as stated in paragraph 9 above, and further in view of Coleman.

With respect to these claims, the above noted base reference fails to describe the ability with respect to offsetting the read signal appropriately.

Coleman et al discloses in the environment of edge detection, the additional capability of offsetting such as the need arises in order to improve the accuracy – see the abstract for instance.

It would have been obvious to modify the base system of Fujimoto with the above teaching from Coleman et al., motivation is as discussed in Coleman et al.

12. Claim 11-12,14-16 are rejected under 35 U.S.C. 103(a) as being unpatentable over the art as applied to claim 4 as stated in paragraph 9 above, and further in view of Ogura.

With respect to claim 11, col. 13 lines 50 plus discuss the acquisition mode of operation and the examiner interprets such as present and that the phase error is continuously provided for and hence

Art Unit: 2653

inherently there must be an appropriate switching circuit so as to permit the shifting from one mode initial/acquisition to tracking as required.

As further taught by the Ogura reference, the switching between operational modes of initial/acquisition to tracking is performed to permit the system to then track the information.

With respect to claim 12, as interpreted by the examiner, Ogura discloses the ability of varying the time control (convergence) of the operation of his pll – see the discussion with respect to figures 6-9.

With respect to claim 14, Ogura also teaches the ability of gain switching ability – see the description of figure 20.

With respect to claims 15-16, Ogura also teaches the ability of having equalizer in his reproduction output circuitry for the inherent use thereof.

It would have been obvious to modify the base system of Fujimoto with the additional teaching from Ogura, motivation is to yield a faster response time of the pll.

13. Claim 13 is rejected under 35 U.S.C. 103(a) as being unpatentable over the art as applied to claim 11 above, and further in view of Sugawara.

The ability of setting circuit for setting a convergence range is not clearly depicted in the above references. Nevertheless, such is taught by the Sugawara reference – see the description of elements 5-10 in figure 2 as it bears upon the operation of the pll. This feedback ability provides for setting the convergence range of the overall pll.

It would have been obvious to modify the base system as stated above in paragraph 12 with the additional teaching from Sugawara, motivation is to increase the response time of the pll.

14. Claim 17 is rejected under 35 U.S.C. 103(a) as being unpatentable over the art as applied to claim 1 as stated in paragraph 9 above, and further in view of Tsuchinaga.

With respect to the ability of normalizing by appropriate circuitry as recited by this claim, there is no such description clearly found in Fujimoto. Nevertheless, Tsuchinaga – see the description of the output of phase comparator 207 with respect to figure 6 which teaches such circuitry in this environment.

It would have been obvious to modify the base system of Fujimoto with the above additional teaching from Tsuchinaga, motivation is to provide for proper threshold levels for the

Art Unit: 2653

comparison/detection and hence "normalize" the error detection capability. Normalization of signal parameters is performed for its inherent advantage.

15. Claim 18 is rejected under 35 U.S.C. 102(e) as anticipated by or, in the alternative, under 35 U.S.C. 103(a) as obvious over Yamaguchi et al.

Yamaguchi et al discloses appropriate phase error calculation for transition states (see abstract for instance) preceding the Viterbi algorithm.

The examiner concludes that the predetermined partial response characteristic is inherently found in the Yamaguchi et al reference.

If applicants' can convince the examiner that such pr is not inherently present, then under 103 grounds the examiner would modify the Yamaguchi et al system with the well known concept of partial response modulation/demodulation techniques which are relied upon in order to yield better signal results.

It would have been obvious to modify the base system of Yamaguchi et al with such well-known techniques, motivation is to yield better s/n ratios relied upon in this environment.

Conclusion

The prior art made of record and not relied upon is considered pertinent to applicant's disclosure. Takagi et al and Taguchi et al are also cited as illustrative of absolute value determining capabilities in this environment for the improvement of the phase lock loop.

A shortened statutory period for reply to this final action is set to expire THREE MONTHS from the mailing date of this action. In the event a first reply is filed within TWO MONTHS of the mailing date of this final action and the advisory action is not mailed until after the end of the THREE-MONTH shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than SIX MONTHS from the mailing date of this final action.

Art Unit: 2653

A shortened statutory period for reply to this final action is set to expire THREE MONTHS from the mailing date of this action. In the event a first reply is filed within TWO MONTHS of the mailing date of this final action and the advisory action is not mailed until after the end of the THREE-MONTH shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than SIX MONTHS from the date of this final action.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Aristotelis M Psitos whose telephone number is (703) 308-1598. The examiner can normally be reached on M-Thursday 8 - 4.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, William R. Korzuch can be reached on (703) 305-6137. The fax phone number for the organization where this application or proceeding is assigned is 703-872-9306.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

Aristotelis M Psitos
Primary Examiner
Art Unit 2653

AMP

